The Age of Reason
Europe After the Renaissance

catalog #2526

Teacher’s Guide

Video Produced by
Chariot Productions

Published & Distributed by…

AGC/UNITED LEARNING

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THE AGE OF REASON
1642-1800

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THE AGE OF REASON
1642-1800
Viewing Time: 22 Minutes

PROGRAM SUMMARY

This program, filmed both in Europe and America, uses historical locations, reenactments, and artwork to provide 8th through 12th grade students with a glimpse of some of the most important cultural and intellectual changes that occurred during the Age of Reason.

The program opens with a review of the Renaissance trends that ultimately gave rise to the Age of Reason. Students learn about the life of Isaac Newton, who is considered to be the major figure behind this era.

Students then discover two very important innovations that resulted in new ways of organizing a growing body of knowledge: Namely, the development of encyclopedias and the development of a system for classifying living things into distinct groups.

Next, students discover that the pursuit of science became a popular pastime during the Age of Reason and that both Benjamin Franklin and Thomas Jefferson were avid amateur scientists. A connection is made between the 18th century mania for science and the invention of important new machines that led to the Industrial Revolution.

To develop a sense of appreciation for “The Quest for Beauty” that was of considerable cultural importance during this era, students tour the grand country estate of the Duke of Devonshire and, as a result, learn how seriously this quest was taken in the mid-18th century.

Students then learn how many of the grandest European homes were built, in part, from money their owners derived from investments in the colonies. Finally, students discover how the American colonists were
greatly inspired by certain prevalent ideals of the Age of Reason when they wrote the Declaration of Independence.

**STUDENT OBJECTIVES**

After viewing this video and participating in the lesson activities, students should be able to:

- Explain the historical meaning of the term "Age of Reason."

- Describe how the work of Sir Isaac Newton led to a flowering of the Age of Reason.

- Summarize the most important historical events that took place in England during Newton's childhood.

- Explain the historical importance of the work of Denis Diderot and Carl Linnaeus.

- Evaluate the role of amateur scientists in the creation of an Industrial Revolution.

- Explain the ways that colonies created wealth for their mother countries and analyze why a colonist might feel resentment toward the mother country.

- Analyze the connection between the scientific revolution of the 17th and 18th centuries and the American Revolution of 1776.

**TEACHER PREPARATION**

Before presenting this program to your students, we suggest that you preview the video and review this guide, along with the blackline masters that accompany it, in order to familiarize yourself with their contents. You may decide to duplicate some or all of the blackline masters before the presentation of this program.
As you review the instructional program outlined in this guide and the accompanying blackline masters you may decide to make certain additions, deletions, or substitutions to meet the specific needs of your class. We encourage you to do so, for only by tailoring this program to your students will they obtain the maximum instructional benefits afforded by these materials.

**INTRODUCING THE PROGRAM**

Introduce this program by stating that much of the way we think about things in the late 20th century has its roots firmly embedded in the great work of Isaac Newton. Before Newton's time there was no method to science and science and Christianity often came into conflict (Galileo is a good example). Newton gave us the rational, mechanistic view of the universe that most people of today still unconsciously embrace. As a result of Newton's development of the scientific method, science flourished and has, for the most part, assumed the role of "giver of truth"--a role that belonged almost entirely to religion up until the Age of Reason.

Newton's great scientific insights were embraced not only by other scientists, but by musicians, artists, philosophers, politicians, and ordinary people as well. Toward the second half of the end of the 18th century, the Age of Reason became known as "The Enlightenment," for it was believed that civilization had reached a point where reason had finally triumphed over superstition. This belief brought a growing sense of the limitlessness of human possibility. And this new sense brought with it demands for greater freedom and equality--demands clearly expressed in the American Declaration of Independence.

Introduce the concept of Deism as it was embraced by Benjamin Franklin, Thomas Jefferson, and Thomas Paine, i.e. a rejection of most conventional forms of religion, accepting reason as the only guide to truth;
the view of God as the master clockmaker who builds the clock, sets it in motion, and then refuses to intervene in its actions. This Deist view of the universe has its roots in the scientific work of Isaac Newton.

Present the Video. Viewing time: 22 minutes.

FOLLOW UP ACTIVITIES

Discussion: After the video presentation, you can lead a discussion based on the following. The script of the video is provided on page 9 of this guide for reference for many of the suggested discussion questions. Other questions are designed to inspire a great deal of thought and perhaps debate. You may even choose to use some of the questions for homework assignments or to choose teams in class for debate.

1. Discuss first the historical meaning of the term “Age of Reason” and make sure students fully understand its significance in history.

2. Discuss how the work of Sir Isaac Newton led to a flowering of the Age of Reason.

3. What importance did the work of Denis Diderot and Carl Linnaeus have during this period in history?

4. What role did amateur scientists have in the creation of an Industrial Revolution?

5. In the modern industrial world, most people tend to look toward science to solve problems; for example, controlling disease, increasing food production, improving transportation, communication, and factory output. To what degree can science be relied upon-- and not relied upon--to solve the social and moral problems of our modern world?

6. Using the Timeline provided on Blackline Master 3, review some of the important historical events that took place during the Age of Reason.
7. What is the value of religion in our modern civilization as compared to the value of science?

8. Why do science and religion often seem to be at odds with one another--for example, evolution versus creationism?

9. During the Age of Reason, many political leaders were also amateur scientists, poets and musicians. Today most American politicians are lawyers. Discuss the implications of this.

10. Discuss ways that colonies created wealth for their mother countries. Why might a colonist have felt resentment toward the mother country?

11. What was the connection between the scientific revolution of the 17th and 18th centuries and the American Revolution of 1776?

**Research Topics:** The following are suggestions for oral and/or written reports. They can be used as individual or group assignments.

1. The Life of Isaac Newton
2. Deism
3. The Work of Voltaire and Rousseau
4. Painting and Sculpture During the Age of Reason.
5. Samuel Pepys
6. Neoclassicism
7. Samuel Johnson
8. 18th Century Science
9. Alexander Pope
10. Thomas Jefferson
11. Benjamin Franklin
12. The European Colonial Empires During the 17th and 18th Centuries.
Extra Credit Report: Assign individuals or groups of students to read the Declaration of Independence, using an encyclopedia or other source in your library, and to write how they feel the American colonists were inspired by certain prevalent ideals of the Age of Reason when they wrote the Declaration of Independence.

BLACKLINE MASTERS/ANSWER KEY

- Blackline Masters 1 and 2, LIST OF TERMS AND IMPORTANT PEOPLE, will help students become familiar with some of the terms and the people important to this time in history.

- Blackline Master 3, AGE OF REASON TIMELINE, shows the years that correspond to specific events in the period covering the Age of Reason. This blackline master is to be used for reference and discussion.

- Blackline Master 4, CROSSWORD PUZZLE, will test student knowledge of the words introduced in the program.

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  1  2  3  4  5  6  7  8

  1. Reason
  2. Age of
  3. Timeline
  4. Jenny
  5. Colony
  6. Defect
  7. Logic
  8. Steam

  Across:
  1. Reason
  2. Age of
  3. Timeline
  4. Jenny
  5. Colony
  6. Defect
  7. Logic
  8. Steam

  Down:
  1. Reason
  2. Age of
  3. Timeline
  4. Jenny
  5. Colony
  6. Defect
  7. Logic
  8. Steam
```
• Blackline Master 5 is the QUIZ for this video presentation. Below is the answer key for the quiz.

1. calculus, method
2. classifying
3. encyclopedias
4. civil war
5. the Black Plague
6. Puritans
7. machines
8. Hudson's Bay Company
9. Thomas Jefferson
10. Ben Franklin
The AGE OF REASON--the period of European history that dawned in the mid 1600s, developed largely as a result of several important scientific advances that had taken place late in the Renaissance--the historical era that came before it.

Among other things, the Renaissance had given rise to two new scientific instruments--the microscope and the telescope.

And, as these devices came into widespread use during the 1600s, many educated people began to see their world in a new light, and as a result, they began to question the old explanations about how the universe functioned. This was due in part to the fact that their ability to see had been remarkably expanded--outward, by the telescope, into the dark reaches of space; and inward, by the microscope, into the fantastic miniature world contained in a drop of pond water.

Each new scientific discovery, whether it was in chemistry, physics, astronomy, or biology, added to a growing conviction that the unique human ability to solve problems in a logical way held the key that would, in time, unlock all the secrets of the universe.

As faith in the power of reason and science grew, certain individuals began to rebel against the dogmatic beliefs and authoritarian political systems they believed were obstructing the free flow of human thought and expression.

In the year 1776, a desire to realize the noblest ideals of the Age of Reason--those of freedom, of equality, and of the pursuit of happiness--led to the revolution of thirteen American colonies against the English throne. And, as
a result, the world's first modern republic was born. Now let us take a closer look at this fascinating period of history by finding out how it developed and learning about the great contributions that certain people who lived during the Age of Reason made to our civilization.

**The Renaissance: The Historical Foundations of the Age of Reason**

The Age of Reason grew out of the cultural Renaissance which began in Italy around 1350 and that slowly spread northward across Europe.

The Renaissance had been an era of rebirth and rediscovery; for during this time artists, scholars, and even politicians had tried to recreate the same level of cultural greatness that had once existed in the ancient civilizations of Greece and Rome. And, although the Renaissance was a time of great religious devotion when many fine churches were built, the people of the era were not involved in religion in quite the same way as their medieval predecessors had been, for growing numbers of people found themselves caught up in a new fascination with the physical world.

As a result of this new fascination, ships sailed out from Renaissance ports on voyages of world exploration. Cities grew, trade increased and created new wealth that occasionally matched the wealth of the land-owning aristocracy.

The invention of the printing press resulted in inexpensive books that allowed new ideas to rapidly spread.

Christianity underwent a movement of reform, and eventually, near the end of the Renaissance, the foundations of modern science were laid down as a result of the research of men like Nicholas Copernicus and Galileo Galilei.

These Renaissance trends, namely the growth of science, of cities, of trade, and of political and religious freedom,
as well as an intense fascination with ancient civilizations, were the raw materials from which the Age of Reason was shaped.

**Isaac Newton and the Scientific Revolution**

A logical date for the start of the Age of Reason is 1642, the year of the birth of Sir Isaac Newton, the single-most important figure of this new historical era, and the same year that the great Renaissance scientist, Galileo, died.

However, some historians prefer to say that the Age of Reason actually began in the year 1686--the year that Isaac Newton published what many consider to be the greatest scientific book ever written: the "Philosophiae Naturalis Principia Mathematica"--the mathematical principles of natural philosophy--a book that was to radically change both scientific thought and method for centuries to come.

In order to get a feeling for this era, let us discover what was happening in England during Newton's childhood.

Isaac Newton was born in this house near the English village of Grantham in the year 1642. At the time of Newton's birth, 35 years had gone by since the founding of the colony of Virginia, and 22 years had passed since the pilgrims landed at Plymouth Rock.

The year of Newton's birth was the year that the English Civil War began that saw the parliament locked in a deadly battle with the crown, and that turned into an economic class struggle led by wealthy merchants and puritans against the monarchy.

By the time Isaac Newton reached the age of seven, the English Civil War had ended with the execution of King Charles I, and for most of Newton's youth, England was ruled by a puritan named Oliver Cromwell, who governed under the title of "Lord Protector."
The monarchy was finally restored in the year 1660, just one year before Isaac Newton entered Trinity College, here at the University of Cambridge.

Immediately after finishing his university studies, Newton decided to return to his rural home to escape from a re-emergence of the Black Plague that was starting to spread outward from London to other English towns.

By the year 1665, this most dreaded of diseases had taken tens of thousands of lives in England alone. But, in spite of this fact, Isaac Newton experienced a burst of scientific insight never matched before or since in human history.

During a brief 18-month period, he worked out the basics of a new branch of mathematics called calculus.

He made the crucial discovery that all the colors of the rainbow are invisibly present in ordinary white light and wrote out the mathematical explanations for this effect.

He was able to understand and mathematically formulate the principles of gravity while watching an apple fall from a tree here in his garden.

And, at the same time, he described the physical laws that govern the motion of objects, calculated the masses of the sun and planets, and predicted the paths of comets—and all of these discoveries were also written down in precise mathematical language.

But perhaps Newton’s greatest achievement was the approach he developed for solving problems that we now call the scientific method.

Before Newton’s time, science consisted largely of a mixture of observation combined with religious mysticism. And this approach rarely yielded predictable
results--in fact, the lack of a consistent, logical method to science accounts for its slow rate of progress up to this time.

However, in contrast to the old ways, Newton's scientific method was based on three essential points: observation, generalization, and experimentation. By using this method, the facts were allowed to speak for themselves in a pure, simple, and, above all, rational way.

And so it was that Isaac Newton completed a scientific revolution begun in the late Renaissance by Nicholas Copernicus and, as a result, gave birth to a new era that we now call the Age of Reason.

**The Organization of Knowledge: Encyclopedias**

As scientists began to use Newton's method and to fully grasp his other scientific insights, the flood of new knowledge they generated was so enormous that a few people dedicated most of their lives simply to collecting and organizing information.

To this end, the Frenchman, Denis Diderot, began to publish the first encyclopedias in the year 1751. These books were an instant success, for by using both words and illustrations, information gleaned from nearly every branch of human knowledge was made easily accessible to the common person. And the political views expressed in these early encyclopedias were to become a major force behind the Revolution that would begin here in the streets of Paris at the end of the 18th century.

**The Organization of Knowledge: Biological Classification**

A few decades before the French encyclopedists began publishing the information they had collected, a man from Sweden named Carolus Linnaeus had undertaken a task of equal difficulty.

Linnaeus sought to develop a method whereby the bewildering array of living things could be separated
into distinct groups; in other words, could be classified in a logical and systematic way.

It was Linnaeus' hope that if such a system of biological classification could be developed, a much deeper understanding of the relationships between living things, and even of the nature of life itself, might be achieved.

To accomplish this goal, he developed a system whereby living creatures were grouped according to their similarities and differences. Going from the creature's most generalized characteristics—those that defined its kingdom whether it was an animal or a plant—down through several intermediate categories, to its most specific characteristics: those that defined its single, unique species.

Besides actually developing this system for biological classification, Linnaeus also undertook another enormous task—that of actually assigning scientific genus and species names to over 12,000 different types of living things.

The task begun by Linnaeus in the early 1700s still continues, and today over one million, four hundred thousand different species of living things have been named and classified.

**Popular Science**

By the time Linnaeus published his famous book on biological classification, the fascination with science had filtered down to a popular level and people from all walks of life, including several famous political leaders, had started to carry out amateur experiments and to invent all sorts of strange new machines.

Benjamin Franklin's experiments with electricity are quite well known.
And, as can be seen by looking at the array of scientific instruments here in Thomas Jefferson's bedroom, it is clear that he, too, was a devoted amateur scientist. And he would no doubt have owned one of these popular 18th century scientific toys, called an orrery, that mimicked the movement of heavenly bodies with clocklike precision.

But Jefferson's interest in science had a practical side as well, for he sought to exploit scientifically-acquired information as a means of establishing a new farwestern frontier for America. For this reason, in 1804, he instructed the Lewis and Clark expedition to keep a detailed record on all of the plants, animals, and minerals they encountered on their journey.

**New Machines: The Birth of an Industrial Revolution**

With the amount of popular interest in science that existed throughout the Age of Reason, it is not at all surprising that some very useful new machines were invented--machines that very soon would dramatically change the way that people worked and lived.

Steam engines similar to this one were in use as early as 1727, and by the end of the 18th century they were occasionally being used as sources of power for certain new machines used in cloth making, such as the Spinning Jenny that spun raw fibers into thread and the the power loom that wove the threads into finished cloth.

Machines like these were to become the new work horses of a growing movement towards industrialization--where machines did the work that had previously always been done by hand.

**A Quest for Beauty**

A premonition that industrialization would soon cause handmade things to disappear may be the force that drove many people of the Age of Reason on a truly
remarkable quest for beauty that come to be epitomized in the fine English country houses of the era.

The enormous mansion seen here, called Chatsworth, is the central home of the Dukes of Devonshire, the first-born sons of the powerful Cavendish family, and its history is very interesting.

The original house built on this land was constructed during the Renaissance, in the mid 1500s, according to the plans of an earl's wife named Bess of Hardwick, so that it would resemble her other house, Hardwick Hall, seen here.

Then, 134 years later, Bess's grandson decided to redesign his Renaissance house in order to reflect a more modern, more enlightened point of view.

Accordingly, Chatsworth House was rebuilt to look as it does today, that is along the lines of an ancient Roman temple ornamented with statues and pillars--an architectural trend known as Neoclassicism.

Under its new one and one-third acre roof were contained 175 rooms, most of them ornately decorated, that were connected by over three-quarters of a mile of passageways and 17 staircases.

By looking at this drawing done in 1699, we can see that at that time Chatsworth was surrounded by over one thousand acres of geometrically planted gardens, which no doubt reflected the duke's fascination with a rational and orderly mind.

However, just 57 years later, his grandson, the fourth duke, decided that these formal gardens were too harsh and unnatural, so he ordered that most of them should be removed. In their place, trees were planted in precisely chosen locations that would be the most pleasing to the eye and yet appear to be natural. Among these trees sheep and cattle grazed assuring that the lawn would always be properly trimmed.
Near the house, colorful flower gardens were planted to reflect the more natural mood of his surroundings, and through his windows the duke could now enjoy his new fountain spewing water far up into the air.

Feeling that he still had not created a perfect environment for himself, the duke then had the course of the river changed to achieve the most graceful possible appearance, and then had this attractive new bridge constructed to reach the house. And, feeling he had somehow neglected his horses, he had these enormous stables built, whose roof alone covers almost an acre of land.

With an estate of this size, over one hundred servants were needed to keep things running smoothly. These servants lived in three different villages on the estate that looked a lot like this one. But because one of these servant villages was located uncomfortably close to the duke's house, he decided that the entire village should be relocated so that all he had to see of it was the steeple of its church. And this beautiful servants' village, called Edensor, is the result of the Duke's relocation efforts.

Today we may think that the job of being a rich man's servant would be quite a miserable one, but, in truth, being a servant in a great house such as Chatsworth was one of the best jobs available to a common person during this era, and the servants who worked here usually came from the same families generation after generation.

Colonies and Wealth
During the Age of Reason, besides Chatsworth, many other magnificent homes were constructed in England-always with an eye toward beauty coupled with a deep sense of order--and each one of them took a fantastic amount of money to build.

It is safe to say that nearly all of these houses were paid for, at least in part, by the wealth their owners derived
from England's colonies. For at that time England was the most powerful country on earth--ruling colonies not only in America, but on every other continent as well.

Spain, too, possessed a vast colonial empire, and by the 1770s was busily establishing a chain of missions in her North American province of Alta California.

These missions were intended not only to bring Christianity to the native people, but also served as schools, factories, and colonial military bases.

Colonies produced wealth for their mother countries in several ways--either in the form of the taxes the colonists were required to pay on imported goods, or directly from the sale of items produced in the colonies, no matter whether these were raw materials, agricultural products, or finished goods.

It should also be noted that during the Age of Reason, a large portion of world trade was in the hands of a few great chartered companies established by certain European monarchs purely to exploit the wealth of their colonial lands.

For example, the farflung outposts of the Hudson's Bay Company were established because, in 1670, the King of England saw to it that company shares were made available to his wealthy friends.

Under its royal charter, the Hudson's Bay Company was given the exclusive right to trap and trade in an area of unexplored land larger than today's United States, so when groups of Hudson's Bay Company trappers out on the frontier of North America sold beaver pelts, a small percentage of each sale went into the pockets of the wealthy shareholders back in Europe and helped to pay for their lavish homes and furnishings.
The American Colonies: The Movement Toward Political Independence

The movement toward political independence by 13 English colonies in America stemmed in part from a deep resentment of colonial exploitation at the hands of what many of the colonists considered to be foreign government that, in their opinion, consisted mostly of rich spendthrift aristocrats who could both tax them and, at the same time, deprive them of proper representation under the law.

But an equally important force behind the American revolution can be found in a marvelous ideal that grew out of revolution in thought inspired by Sir Isaac Newton nearly one hundred years before—namely, the unshakeable belief that if equality and freedom were allowed to flourish in an atmosphere of reason, respect, and faith in God, there were few limits to what a human being might achieve.

THE END
TRUE OR FALSE
Directions: Indicate whether each statement is true (“T”) or false (“F”).

1. Christopher Columbus was the leader of the first European expedition that attempted to find a new trade route to Asia by sailing west from Europe.

2. Columbus started the first Spanish colony in the New World.

3. In the fifteenth century, Spain and France were the leaders in world exploration.

4. Vasco da Gama led the first European expedition that sailed around the tip of South America.

5. In 1400, no Native American had ever seen a horse.

6. The development of gunpowder by the Aztecs made it easy for them to win most of their battles with the Spanish.

7. Amerigo Vespucci was the first European to realize that South America was an undiscovered continent, instead of being part of Asia.

8. The earliest long distance explorations by fifteenth century Europeans were along the coast of Africa.

9. The discovery of Australia by Europeans in 1410 was what made them think the world was round.

10. In 1420, the best map of the world was over one thousand years old.
DISCUSSION QUESTIONS

Directions: Discuss the answers to these questions. Use this sheet to keep notes. Use the back of the sheet if necessary.

1. What are some reasons why Native Americans resent the fact the Columbus was glorified for so long?

2. Why do so many people think that Columbus shouldn’t be credited for discovering America?

3. In the 1400s, there was very little trade or communication between continents and yet today it is difficult to imagine a world without these things. How do the countries of the world benefit from these exchanges? How are they harmed?

4. What were some of the greatest differences between European and New World civilizations in the 1400s?

5. What cultural attitudes existed on the part of fifteenth century Europeans that made them feel it was alright to buy and sell Africans or enslave native Americans?

6. How did restrictions on trade with the Far East help initiate the Great Age of Exploration?

7. What were some of the factors unique to the Renaissance that helped propel the Great Age of Exploration?
VOCABULARY LIST

Directions: From the vocabulary list below, identify the following by filling in the blanks:

1. Find the names of three cities in the New World built before the time of Columbus.
   ___________________________________________ and ___________________________________________ and ___________________________________________

2. Find the names of three explorers who were not born in Portugal or Spain.
   ___________________________________________ and ___________________________________________ and ___________________________________________

3. Using the vocabulary list, find the names of three navigational instruments.
   ___________________________________________ and ___________________________________________ and ___________________________________________

ASTROLABE A navigational instrument used by explorers during the Age of Exploration to find the altitude of stars. This information helped determine the position of a ship at sea. In the 1700s, the astrolabe was replaced by the sextant.

ATAHUALPA (ah–tah–whall–pah) Ruler of the Inca Empire at the time of the Spanish conquest in 1533.

AZTEC A North American tribe that developed a high level of civilization and ruled central Mexico from 1300 to 1519.

BALBOA, VASCO NUNEZ DE (1475–1517) Spanish explorer who, by crossing the Isthmus of Panama, discovered the Pacific Ocean in 1513.

BLACK DEATH The bubonic plague; a disease carried by rat fleas which can bring rapid death. In the mid 1300s, about 25 million people, a third of the population of Europe, was wiped out by the Black Death.

CABOT, JOHN (1450–1498) The Italian navigator who in 1497 sailed for England across the North Atlantic and reached North America. Some believe he was the first European to reach the mainland of North America.

CABOT, SEBASTIAN (1474–1557) Son of John Cabot, he explored the coast of Greenland and North America in 1509.

CAO, DIOGO Portuguese explorer who discovered the mouth of the Congo River.

CARAVAL A small, fast, type of sailing ship that sat high in the water and that was used by most Spanish and Portuguese explorers in the fifteenth and sixteenth centuries.

CIBOLA The mythical seven cities of gold believed to be in the Southwestern part of today’s United States. It was the search for Cibola that inspired the expedition of Coronado in 1540.

CIRCUMNAVIGATE (sir–come–nav–uh–gate) To sail around something. For example, some of Magellan’s crew succeeded in circumnavigating the world from 1519–1522.

CIVILIZATIONS Distinct groups of people who have achieved a high level of social organization and are usually very advanced in both art and science.

CODEX A colorfully illustrated Aztec book. The Spanish conquerors of Mexico destroyed nearly all of the Aztec’s books.
VOCABULARY LIST

CONQUISTADORS (Con–kees–tuh–doors) Spanish conquerors.

CORONADO, FRANCISCO (1510–54) Spanish explorer of the Southwestern U.S. in 1540–1541.

CORTEZ, HERNAN (1485–1547) The man who led the Spanish conquerors of the Aztecs from 1519 to 1521.

CRUSADES (1096–1270) Unsuccessful war by Christians against the Moslems to recover the Holy Land. After the Crusades, the Moslems refused to allow Christian travel in their lands.

CULTURE All the things that make up a civilization, such as its art, institutions, habits, and special skills.

CUZCO Capital of the Inca Empire located in Peru.

Dias, BARTHOLOMEU (1450–1500) Portuguese navigator and explorer who reached the Cape of Good Hope in 1488.

DORANTEZ, ESTEBAN (died 1541) The shipwrecked African slave who guided the Coronado expedition into the lands of what is today the Southwestern U.S. He was killed at Hawikuh Pueblo, New Mexico, in 1541.

DRAKE, FRANCIS (1543–1596) Famous English explorer and adventurer. He was the first Englishman to sail around the world (1577–80). He looted Spanish New World settlements and was personally responsible for destroying much of the Spanish navy, as well as the Portuguese School of Navigation founded by Prince Henry the Navigator.

ERICSON, Leif The Viking adventurer who is thought to have discovered Vinland (North America) in the late tenth or early eleventh century.

ERIC THE RED Father of Leif Ericson. Eric the Red was a Viking navigator who discovered and colonized Greenland in the tenth century.

GAMA, VASCO DA (1469–1524) Portuguese navigator who in 1498 discovered a sea route to India from Portugal by sailing around Africa. Vasco Da Gama also founded colonies in Africa.

HENRY THE NAVIGATOR (1394–1460) Portuguese prince whose school of navigation (founded 1416) helped start the Age of Exploration. Prince Henry was very influential helping Portugal become a leader in colonial expansion.

INDIANS Columbus called the native American people “Indians” because he believed the islands he had found were near India.

INCAS A powerful South American civilization from the thirteenth to sixteenth centuries once located in Peru and Bolivia.

MAGELLAN, FERDINAND (1480–1521) Portuguese navigator and explorer who led the first expedition around the world (1519–1522) but was killed along the way. Magellan named the Pacific Ocean, a name which means “calm” or “peaceful.”

MARINER Seaman or sailor.
VOCABULARY LIST

MAYA Tribe of southern Mexico; Honduras and Guatemala that developed a very powerful civilization between 300 and 810 A.D.

MOLUCCAS The Spice Islands of the East Indies. Today the Moluccas are part of Indonesia.

MONTEZUMA THE SECOND (1466–1520) Aztec Emperor from 1502 to 1520.

MOVABLE–TYPE PRINTING A method of printing first developed by the Chinese in the eleventh century and reinvented in Germany around 1440. By being able to “type-set” or reuse and rearrange the letters used to print pages of books, books were finally able to be mass produced for the first time in history. Inexpensive books made access to information much more available to ordinary people during the Renaissance.

NAVIGATION The science of locating and plotting the position of ships at sea.

NAVIGATOR A person skilled at navigation.

PIZARRO, FRANCISCO (1471–1541) The man who led the Spanish conquest of the Incas in 1533.

PRE–COLUMBIAN Refers to the time before Columbus arrived in the New World.

PTOLEMY (tall–oh–me) An astronomer, mathematician, and geographer who lived in the second century A.D. in Alexandria, Egypt. In the 1400s, his map of the world was considered the best there was.

QUADRANT An instrument used in navigation for determining the altitudes of heavenly bodies.

RENAISSANCE (ren–is–sonce) The period in the history of Europe that follows the “Middle Ages” (the Medieval era). The Renaissance was a “rebirth” of interest in art and science that began in different countries at different times after about 1400. Both the Age of Exploration and the Protestant Reformation began during the Renaissance.

SAN SALVADOR The name Columbus gave to the island in the present day Bahamas on which he landed on October 12, 1492.

SOTO, HERNANDO DE (1500–42) Served as second in command under Pizzaro during the Inca conquest. (DeSoto actually supported the Inca emperor Atahualpa whom Pizarro had hanged.) DeSoto went on to explore the Southeastern region of today’s United States and is credited with being the European discoverer of the Mississippi River.

SEXTANT A navigational instrument which helps determine the position of a ship by measuring the angle between the horizon and heavenly body. Invented around 1730, sextants replaced the astrolabes used by most explorers of the Age of Exploration.

SLAVERY A relationship between two persons in which one is owned by the other as property. In the empires of ancient Greece and Rome, most people (up to 90%) were slaves. Spain and Portugal became the world’s greatest slave traders in later history when they took over the traffic in African slaves from the Arabs. The Spanish also enslaved huge numbers of the Latin American native population, especially the Aztecs, Incas, and Mayas.
VOCABULARY LIST

SMALLPOX  A highly contagious, often deadly viral disease that causes thousands of tiny sores all over the body. Smallpox was accidentally brought to the New World by Europeans. Native Americans had no natural immunity to smallpox and epidemics of the disease brought death to large numbers of their population. Smallpox was also the first disease to be prevented by vaccination by Edward Jenner in 1796.

TENOCITLTLAN (te–noch–tee–TLAHN) Capital city of the Aztecs founded around 1330 on site of present day Mexico City, Mexico.

TEOTIHUACAN  ( Tay–oh–tee–wa–Con) A great city of ancient Mexico known for its huge pyramids. The people who built this city, the Teotihuacans, controlled the Valley of Mexico for many centuries.

TREATY OF TORDESILLLAS (tor–day–see–yahs) Treaty of 1494 by which, with the pope’s approval, the undiscovered territories of the world were divided between Spain and Portugal. All lands west of the Cape Verde Islands were to be Spanish; all those to the east, Portuguese.

TIKAL  (tee–KAHL) A huge Mayan city located in today's country of Guatemala.

VIKINGS  Roving Scandinavians whose lives were based on plundering and seafaring. Vikings made it all the way to North America four centuries before Columbus. Vikings are also known as Norsemen.

VERRAZANO, GIOVANNI  An Italian who explored the coast of North America for France in 1542.
1250 A.D. Incas settle at Cuzco, Peru, which would become the capital of their empire. Cliff cities are built on Mesa Verde in Southern Colorado by people known as the Anasazi.

1330 A.D. The Aztecs found their great city of Tenochtitlan where they see an eagle sitting on a cactus with a snake in its beak.

1346 A.D. In Europe the Black Death, a huge outbreak of plague carried by rat fleas, kills 25 million people, one third of the population.

1347 A.D. The first guns appear in Europe

1390 A. D. The author of the “Canterbury Tales,” Geoffrey Chaucer writes a book that tells how to construct and use the astrolabe, an instrument for navigating by the stars.

1400 A.D. Major improvements are made in building sailing ships.

1406 A.D. The long lost map of the world drawn in the 2nd century by the geographer Ptolemy is rediscovered in western Europe. It becomes the best existing map of the world. Ptolemy’s map makes Columbus think that Asia can be reached by sailing west from Europe.

1416 A.D. Prince Henry the Navigator organizes a school of Navigation and base for explorations on Cape St. Vincent in Portugal.

1420 A.D. The first Caravels are built. For the first time an Asian ship enters the Atlantic Ocean by rounding the Cape of Good Hope.

1440 A.D. The Guttenberg bible is printed on a printing press that uses movable type. This invention made it possible for books to be made cheaply and for knowledge to spread more rapidly than ever before in history.

1431 A.D. The first Chinese ship reaches Africa

1442 A.D. The first auctions of black slaves take place in Portugal in a slave market near the school of navigation.
TIMELINE

1453 A.D. Moslem Turks capture the great Christian City of Constantinople. Some historians use this date as the begin-
ing of the Renaissance. After this time the Genoese put their financial support behind Portuguese efforts to find a new route to Asia.

1465 A.D. Navigation by the stars has become greatly improved.

1487 A.D. Bartholomew Dias becomes the first European to reach the southern tip of Africa; The Cape of Good Hope.

1492 A.D. Christopher Columbus lands in the Bahamas. After seven centuries the last Moslems are driven from Spain. Leonardo da Vinci draws plans for a flying machine.

1493 A.D. Columbus discovers that native Americans use tobacco as a medicine.

1494 A.D. Treaty of Tordesillas divides the world’s undiscovered lands between Spain and Portugal.


1497–98 A.D. Portuguese explorer Vasco da Gama reaches India by rounding the tip of Africa.

1498 A.D. Columbus discovers the South American continent but believes it is part of Asia.

1499 A.D. Amerigo Vespucci explores along the coast of South America and decides it is a new continent and is not part of Asia.

1500 A.D. The Inca empire extends along much of the west coast of South America.

1502–04 A.D. The last of Columbus’s four voyages to the New World.

1504 A.D. Using a book on astronomy, Columbus predicts a total eclipse of the moon. He uses this information to frighten a group of Native Americans.

1506. A.D. Columbus dies.

1507 A. D. A new map of the world uses the name “America” for the newly discovered southern continent in honor of Amerigo Vespucci.

1509 A.D. Sebastian Cabot explores the coast of Greenland and enters Hudson’s Bay.

1512 A.D. Portuguese explorers reach the Spice Islands in the East Indies (The Moluccas).

1513 A.D. Balboa crosses the Isthmus of Panama and discovers the Pacific ocean. Ponce de Leon lands in Florida.

1514 A.D. Smallpox brought by Europeans begins to wipe out native populations in the Americas.

1517. A.D. Martin Luther starts the Protestant Reformation in Germany.
TIMELINE

1519 A.D. Ferdinand Magellan leaves Spain with five ships to find a “southwestern passage” to Asia. Hernan Cortez enters the Aztec Capital of Tenochtitlan to meet with the Aztec emperor.

1520 A.D. Magellan rounds Cape Horn at the tip of South America and enters an ocean he names the “Pacific.”

1521 A.D. Fall of the Aztec Empire to Spanish Forces. The capital of New Spain (Mexico City) is built on the ruins of the Tenochtitlan.

1522 A.D. The last remaining of Magellan’s five ships with a crew of 17 men returns to Spain ending the first voyage around the world.

1533 A.D. Atahualpa, emperor of the Incas, is hanged by the Spanish conqueror Pizzaro. Spain conquers the Inca empire which was already being destroyed by a smallpox epidemic and civil war.

1535 Spanish conquerors found the city of Lima, Peru.

1539 A.D. Spanish explorer De Soto explores what is today the Southeastern U.S.

1540 A.D. The Spanish explorer Coronado explores the American Southwest.

1541 A.D. The Spanish explorer Hernando DeSoto explores the Mississippi River.

1542 A.D. Giovanni Verrazano explores the coast of North America for France.

1543 A.D. The astronomer Nicholas Copernicus publishes a book which says that the Earth and the other planets revolve around the sun. Biologist Andreas Versalius publishes the first accurate book on human anatomy.

1565 A.D. Spanish found the city of Saint Augustine in Florida.

1577–80 A.D. Sir Francis Drake becomes the first Englishman to circumnavigate the globe.

1586 A.D. Sir Walter Raleigh imports the habit of tobacco smoking from Virginia to England.

1587 A.D Sir Francis Drake destroys much of the Spanish fleet as it lays anchored in the harbor of Cadiz, Spain.

1588 A.D. The destruction of the Spain’s great Armada by Francis Drake and another commander makes England the world’s greatest seapower.

1606 A.D. Dutch explorers discover Australia.

1607 A.D Jamestown in Virginia is established by the English.

1609 A.D. Galileo builds his first telescope.

1610 A.D. The city of Santa Fe, New Mexico is founded by the Spanish. The French establish the colony of Quebec.
CROSSWORD PUZZLE

ACROSS
1. On October 12, 1492, a fleet of three ships commanded by a man named ___________ reached the islands that today we call the Bahamas.
2. A Spaniard named Pizarro conquered the great empire of the ___________ in Peru.
3. The Spanish in the New World had a big advantage over the native tribes because they had ___________ which allowed them to rapidly move both soldiers and equipment.
4. The science of being able to tell the position of a ship when it is far out at sea is called ________________.
5. In 1492, Ferdinand and Isabella ruled the country we now call ________________.

DOWN
1. The man who led the conquest of Mexico was named Hernando __________.
2. The man who led the first voyage around the world, but died on the way, was named Ferdinand ________________.
3. The Age of Exploration began because people wanted to find a new route to the continent of ________.
4. In 1519, the Aztec capital stood on the site of modern day ______________ City.
5. North and South America were named after an explorer called ___________ Vespucchi.

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MAP ACTIVITIES

Directions: On the maps provided by your teacher, trace the routes of the voyages listed below. Use arrows to indicate the direction of travel for each route.

(1.) Magellan’s voyage around the world (1519-1522)
(2.) Vasco de Gama’s voyage to India (1497-1499)
(3.) Bartholomeu Diass’ voyage (1487)
(4.) Christopher Columbus’s first voyage (1492-1493)
(5.) Amerigo Vespucci’s first voyage (1499-1500)
(6.) John Cabot’s first voyage (1497)
(7.) John Cabot’s second voyage (1498)
A favorite food of the Aztecs were cornmeal tamales, and although they usually filled them with beans, fruit, peppers, or fish the Aztecs sometimes added delicacies like insect eggs, boiled grasshoppers, snails, and red worms.

When Cortez conquered the Aztecs in 1521, their empire of fifteen million people stretched from the Atlantic to the Pacific and was made up of 38 different provinces containing nearly 500 towns.

There were no horses in either North or South America until the Spanish conquerors came.

The following crops were not found in Europe until they were imported from the Americas:
- Corn (Maize)
- Potatoes
- Tomatoes
- Avocados
- Chocolate
- Tobacco

By 1519, the Aztecs were sacrificing about 20,000 people a year to the gods by cutting out their beating hearts, and since most of the victims were prisoners of war, the Aztecs came to believe that war was needed for their empire to survive.

The ancient Maya people of Mexico and Central America never established a single nation. Instead, they lived in many separate kingdoms that were often at war with one another. The Mayan kings were both head warriors and priests. The kings often drew their own blood and offered it to the gods during religious ceremonies.

The Maya were the only native American people to invent a complete writing system. Even though the Aztecs used “picture writing” to record names and events only, the Maya were able to write complete sentences.

The Maya played games using rubber balls. They were not allowed to touch the balls with either their hands or feet; instead, they had to hit the balls with their chest, hips and shoulders.

About 5000 priests worked at the temple of Huizilopochtli, the Aztec god of war.

Today the flag of Mexico is decorated with an unusual picture of an eagle. This picture comes from an old legend which said that the Aztecs must build a great city wherever they saw an eagle on a cactus with a snake in its beak. That is why they built their capital, Tenochtitlan, where modern day Mexico City stands.

In the early 1600’s, the following supplies were needed to supply a ship and 190 men for a three months voyage at sea:

- four tons of salt beef
- 600 pounds of salted codfish
- 30 bushels of oatmeal
- one barrel of salt
- eleven small casks of butter
- 3,500 gallons of water
- 2,800 pounds of salt pork
- 15,000 pounds of salted codfish
- 40 bushels of dried peas
- 100 pounds suet (beef fat)
- one large cask of vinegar
- two large casks of apple cider
- a few beef tongues
- 5000 white biscuits
- 1.5 bushels of mustard seed
- one barrel of flour
- 10,000 gallons of beer
- 3,500 gallons of water

Besides the supplies listed above, the captains stores held some cheese, pepper, currants, cloves, sugar, aqua vitae (an alcoholic drink), ginger, prunes, bacon, marmalade, almonds, cinnamon, wine, and rice.
8a

QUIZ

(1.) MATCHING
Directions: Fill in the blank with the correct name from the list below.

Ferdinand Magellan        Prince Henry the Navigator
Sebastian Cabot           Bartholomeu Dias
Christopher Columbus      Montezuma II
Prince Henry the Navigator John Cabot
Vasco da Gama              Bartholomeu Dias
Amerigo Vespucci          Francisco Pizarro

__ a. Even though he made four trips to the New World from 1492 to 1503, this man continued to believe he was exploring parts of Asia.

__ b. This man led the Spanish conquest of the Incas.

__ c. This explorer was the first person to sail across the North Atlantic for England.

__ d. This man founded a great school for navigators in Portugal.

__ e. This man was the first European to reach the tip of Africa.

__ f. This navigator was the first European to reach India by sailing around Africa.

__ g. This explorer assembled a fleet of five ships to find a “Southwest Passage” to Asia around South America

(2.) TIMELINE
Directions: List the following historical events in the order in which they occurred by numbering them sequentially:

__ a. Fall of the Inca empire
__ b. Invention of the movable–type printing press in Europe
__ c. Completion of the first voyage around the world
__ d. First Europeans reach India by sea around Africa
__ e. Vikings explore the coast of Canada
__ f. The first Navigation School is established in Portugal
__ g. Fall of the Aztec Empire
__ h. Columbus makes his first voyage to the New World
__ i. First Europeans reach the tip of Africa
__ j. Every person in the New World’s first European settlement dies
__ k. The map of the world used by Columbus is created
8b

QUIZ

(3.) ESSAY QUESTIONS
Directions: Answer the following questions in the spaces provided. Use the back of this sheet if necessary.

a. Name three advantages the Spanish had over the native people of the Americas when it came to warfare.

b. Name three important consequences of the European colonization of the New World.

(4.) MAP ACTIVITIES
Directions: On the map provided, trace the voyage routes listed below.

a. Vasco De Gama’s voyage from 1497 to 1499
QUIZ

Name

Explorer:

Year(s):

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The Age of Discovery (1400-1550) #2439

Distributed by United Learning
VIDEO QUIZ

Directions: Answer the following questions as they appear on the screen after the video presentation. Select your answers from the list that follows each question.

1. In the 1400s, the Spanish and Portuguese were inspired to find new routes to the Far East because nations of the __________ religion controlled trade with Asia.
   - Buddhist
   - Jewish
   - Christian
   - Moslem
   - Hindu

2. This man, named __________________________, founded an important School of Navigation in Portugal.
   - Bartholomeu Dias
   - Sebastian Cabot
   - Christopher Columbus
   - Prince Henry the Navigator
   - Amerigo Vespucci

3. Vasco da Gama was the first European to reach ______________ by sailing around the Cape of Good Hope.
   - South America
   - North America
   - India
   - Peru
   - Mexico

4. True or False: Christopher Columbus discovered the land that today makes up the United States.
   - True
   - False

5. New types of ships called ______________ were used by many explorers during the Age of Discovery.
   - Frigates
   - Galleons
   - Caravels
   - Schooners
   - Ironclads

6. True or False: Magellan died during his attempt to sail around the world.
   - True
   - False

7. The Spanish conqueror of Mexico was named ____________.
   - Hernando de Vaca
   - Francisco Pizarro
   - Bartholomew Días
   - Hernando Cortez
John Cabot

9b

Name __________________________

VIDEO QUIZ

8. The Spanish conqueror of Peru was named _____________.
   Hernando de Vaca   Francisco Pizarro
   Bartholomew Dias   Hernando Cortez
   Ponce de Leon

9. True or False: Columbus made several voyages to the West Indies during his lifetime.
   True
   False

10. John Cabot sailed to North America from the country of ____________ in 1497.
    France
    Portugal
    Mexico
    Spain
    England